U.S. Department
of Transportation

Federal Aviation Administration

Advisory Circular

Subject: AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM

Date: 10/23/98
Initiated by: AAS-200

AC No: 150/5345-53B
Change:

1. PURPOSE. This advisory circular (AC) describes the Airport Lighting Equipment Certification Program (ALECP). It provides information on how an organization can get Federal Aviation Administration (FAA) acceptance as a third party certification body (third party certifier) and how manufacturers may get equipment qualified under the program. It includes a list of FAA accepted certification bodies and a list of products that are certified under the program. This AC does not impose requirements or mandate participation in the ALECP by any party. The AC is intended only to describe the criteria that FAA will use to determine whether a certification body qualifies for participation and how equipment may be qualified.

2. CANCELLATION. AC 150/5345-53A, *Airport Lighting Equipment Certification Program*, dated May 15, 1995, is cancelled.

3. BACKGROUND. Until December 31, 1989, the FAA administered the Airport Lighting Approval Program under the Federal airport grant programs. Under this program the FAA inspected equipment to confirm that it met FAA standards and to ensure quality control. The program was discontinued as of December 31, 1989, as a result of declining FAA resources. The listing of equipment in AC 150/5345-1, *Approved Lighting Equipment*, was no longer maintained.

On January 1, 1990, a new program was established which named a commercial testing laboratory under the oversight of an Industry Technical Advisory Committee (ITAC), as the program certification body. On May 15, 1995, the FAA, realizing that there were additional commercial laboratories that may want to participate as certification bodies instituted and established the Airport Lighting Equipment Certification Program. This program provided that any commercial laboratory meeting certain criteria may participate as a certification body and provided for FAA oversight and acceptance of certification bodies.

Under the ALECP, the FAA has established a list of accepted certification bodies. The certification bodies evaluate and certify airport lighting equipment and license suppliers to mark qualifying products. The FAA maintained a list of certified equipment as part of the AC. This list was provided to assist airport sponsors in discharging their duty to determine that equipment met the applicable FAA specifications, which is required for eligibility for funding under Federal grant assistance program for airports.

This AC, as a continuing refinement of the ALECP, institutes and establishes a recertification requirement for the equipment under ALECP (Appendix 2) and a list of the type of equipment with their applicable ACs which are under this program (Appendix 3). Lists of currently certified equipment and of manufacturers' addresses are maintained by the FAA on the Internet.

4. INTERNET ACCESS. This AC, the latest certified equipment list, and the address list of certified airport lighting equipment manufacturers are available on the Internet at the FAA Office of the Associate Administrator for Airports (ARP) home page on the Internet's World Wide Web (www). The direct Internet address is: www.faa.gov/arp/arphome.htm.

DAVID L. BENNETT
Director, Office of Airport Safety and Standards

AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM

1. GENERAL. The FAA has established the Airport Lighting Equipment Certification Program. This program is implemented by third party certification bodies found acceptable by the FAA and is intended for equipment funded for instal-lation under the FAA airport grant program. The purpose of the program is to assist airport sponsors in discharging their duty to ensure that airport lighting equipment meets the applicable FAA standards for safety, performance, quality, and standardization.

2. CERTIFICATION PROGRAM.

a. Procedures. Manufacturers of lighting and visual aids equipment that desire to participate in the program may select any third party certification body from the list contained in Appendix 1, Third Party Certification Bodies. A licensing agreement, as outlined in paragraph 7, detailing the relationship between the manufacturer and the third party certification body and their respective responsibilities is then developed. A procedural guide, as outlined in paragraph 8, supplements the agreement and describes the operational aspects of the program. Equipment is evaluated by the third party certification body under the procedures contained in Appendix 2, Equipment Qualification Procedures. The manufacturer is issued a "Certificate of Conformance" by the third party certifier for each type of equipment that meets the applicable FAA standards. A copy of each Certificate of Conformance shall be submitted to the FAA by the third party certification body. The certified equipment on a monthly basis will then be added to the Certified Airport Lighting Equipment in an addendum file to this AC under the Internet home page for Airports. Copies of this file may be obtained from AAS-200, or from those FAA offices as listed in AC 150/5000-3, *Address List for Regional Airports Divisions and Airports District/Field Offices*, current edition.

b. Costs. The program is funded entirely by fees paid by participating manufacturers. The fee schedule may be obtained from the third party certification body(s) listed in Appendix 1.

3. ITAC. The ITAC is comprised of all manufacturers who have certified equipment under the program. ITAC members participate directly in reviewing the AC, in developing detail test plans from the AC requirements, when required, and in reaching an industry consensus on equipment specification ACs.

4. ACCEPTANCE CRITERIA. An entity may become an FAA accepted third party certification body if it demonstrates conformance with the American National Standards Institute (ANSI) Z34.1, Third Party Certification Programs, for Products, Processes, and Services, and:

a. has been in operation as a third party certification body for a minimum of 3 years.

b. has a permanent assigned staff, knowledgeable in photometrics, if required for the scope of services offered, and other disciplines related to testing and quality control.

c. is under the supervision of a professional (Bachelor of Science Degree in related field; i.e., engineering, physics, physical science, etc.) with a minimum of 4 years experience in interpreting testing standards/specifications, test methods, evaluating test reports and quality assurance programs.

5. DUTIES OF THIRD PARTY CERTIFICATION BODY. In addition to administering the qualification program (Appendix 2), a third party certification body must assure that the manufacturer provides and maintains a quality system in accordance with FAA-STD-013, *Quality Control Program Requirements*, or suitable alternative, such as ISO 9000 or Department of Defense quality standards. An initial quality audit must be performed by the third party certification body to ensure adherence. It must also assure that testing laboratories which perform qualification testing conform to the requirements of the International Organization for Standardization /International Electrotechnical Commission (ISO/IEC) Guide 25, General Requirements for the Competence of Calibration and Testing Laboratories. Semiannual inspections of manufacturers must also be conducted (see paragraph 8f).

6. APPLICATION. In order to be listed as a third party certification body, the certification body must agree to undergo an assessment to determine if it qualifies. The FAA will provide application information upon request. Requests should be submitted to:

Federal Aviation Administration
Engineering & Specifications Division, AAS-200
800 Independence Ave., SW
Washington, DC 20591

The following information must be submitted with the application:

a. Summary of background as a third party certification body.

b. Resumes of permanent staff members who will be assigned to the certification program.

c. Draft copy of procedural guide and licensing agreement for the Airport Lighting Equipment Certification Program. A schedule of fees does not have to be included in the licensing agreement.

d. Scope of certification activities for which it is seeking approval, if it is less than the total program.

If the FAA determines that the third party certification body conforms to all criteria, a letter of acceptance will be issued to that body and they will be listed in Appendix 1.

7. **LICENSING AGREEMENT.** The licensing agreement details the relationship between the manufacturer and the third party certification body, and their respective responsibilities in the program. A schedule of fees for participation in the program, including the yearly Administrative Services fee and fees for quality control review and witnessing of tests, will be part of the agreement.

8. **PROCEDURAL GUIDE.** The Procedural Guide describes the operational aspects of the third party certification program and addresses the elements listed below as a minimum. (See Appendix 6 for Procedural Guide Outline).

a. **Scope**. Outline generally how the Airport Lighting Equipment Certification Program functions. It should discuss how the certifier will implement the Equipment Qualification Procedures contained in Appendix 2.

b. **Quality Control Program**. Outline procedures for assuring manufacturer's compliance with the provisions of FAA-STD-013, or alternative (see paragraph 5).

c. **Equipment Requirements.** Outline how the equipment requirements will be evaluated.

d. **Equipment Qualification Tests**. Outline how equipment qualification tests will be conducted. The third party certification body may witness tests conducted by a manufacturer at the manufacturer's laboratory or tests conducted at a third party laboratory. All laboratories in which equipment is tested will be subject to inspection and audit to assure conformance with ISO/ IEC Guide 25.

e. **Production Tests**. Outline procedures for ensuring that routine production tests, as required by ACs, have been conducted. During the semiannual inspections (see paragraph 8f), the third party certifier may request to witness some of the production testing.

f. **Semiannual inspections.** Outline procedures for conducting semiannual inspections at the manufacturing site of the participant to determine that the manufactured equipment is the same as the sample subjected to the qualification tests. The inspections may be scheduled or unannounced, at the option of the third party certifier. It is intended that samples of all certified equipment produced in a given year be inspected at least once during these visits. If equipment is not being produced during the semiannual visit, the third party certifier will review the production records and test data for that equipment. Nonconformance to specifications found during these inspections will result in suspension of the model, as certified, unless corrections are made. If production test records are not available, the certificate will be suspended. The third party certifier shall notify the FAA within 24 hours of any suspension or withdrawal of equipment.

g. **Appeals Procedure.** Outline procedures for conducting an appeals program. Under this procedure a manufacturer who is affected by an adverse determination by the third party certifier with respect to its certified equipment or its participation in the program, may appeal the determination to the third party certification body.

h. **Challenge Procedure**. Outline procedures for conducting a challenge program. Under this program, if a manufacturer believes another manufacturer's equipment does not meet specification requirements, it may challenge that manufacturer's certification by submitting to the third party certifier a written statement of reasons for the challenge. The statement shall

specify the section(s) of the particular specification being challenged. The third party certifier will follow the challenge procedures developed. The challenged manufacturer's equipment shall remain on the Certified Airport Lighting Equipment list while the challenge is underway.

i. **Forms.** The use and function of forms to be used in administering the program should be addressed. The "Certificate of Conformance" must follow the sample shown in Appendix 7.

9. INSPECTION OF FACILITIES. Each participating third party certification body must agree to make facilities and program records available to the FAA or its representatives both initially and at all reasonable times thereafter for inspection. The FAA reserves the right to accompany the third party certification body to a manufacturer's facility or testing laboratory to witness qualification tests, quality control audits, site production tests, or inspections. The FAA also reserves the right to have staff or designated representatives visit the third party certifier for review of its program.

10. DURATION OF LETTER OF ACCEPTANCE. A letter of acceptance by the FAA is valid for a period of 2 years. However, a third party certification body which wishes to continue in the program may reapply by resubmitting the information called for in paragraph 6 above, plus a statement covering any problems experienced that may relate to safety and reliability of products certified. However, should a third party certifier make any changes in the program prior to that time, the FAA is to be notified and changes approved, before said changes are implemented. Any questions concerning this program or the operation of any of the accepted third party certification bodies should be sent to:

Federal Aviation Administration
Engineering & Specifications Division, AAS-200
800 Independence Ave., SW
Washington, DC 20591

11. WITHDRAWAL OF LETTER OF ACCEPTANCE. In the event the third party certification body does not meet the criteria of this AC, the FAA reserves the right to withdraw the letter of acceptance.

12. THIRD PARTY CERTIFICATION BODY CHALLENGE PROCEDURE. If the FAA receives information that a third party certification body believes another third party certification body is not performing in accordance with the minimum criteria of this AC, the FAA will notify the challenged party and investigate the charges. If the challenge is upheld, and the third party certifier is not performing in accordance with the criteria set forth in this AC, at the end of 30 days, the FAA reserves the right to withdraw the letter of acceptance.

APPENDIX 1. THIRD PARTY CERTIFICATION BODIES. (As of October 1998)

The following Third Party Certification Bodies (Third Party Certifiers) have met the requirements contained in this advisory circular and have been accepted as Third Party Certifiers under the Airport Lighting Equipment Certification Program.

Intertek Testing Services
(formerly ETL Testing Laboratories, Inc.)
3933 U.S. Route 11
Cortland, New York 13045
(607) 753-6711 or (800) 345-3851

Detroit Testing Laboratory, Inc.
7111 E. Eleven Mile
Warren, Michigan 48092
(810) 754-9000

APPENDIX 2. EQUIPMENT QUALIFICATION PROCEDURES.

1. QUALIFICATION PROGRAM. The purpose of the qualification program is to provide airport operators with a list of equipment that meets the required standards for safety, performance, quality, and standardization. Manufacturers are subject to a quality audit and twice yearly quality assurance inspections by the third party certifier. Manufacturers submitting products for qualification must have a representative in North America to provide aftermarket services to purchasers of the equipment.

2. EQUIPMENT COVERED BY THE QUALIFICATION PROGRAM. The equipment included in the 150 series of ACs, as listed in appendix 3 of this AC, is covered by the qualification program. The equipment covered may be changed peri-odically to reflect changing needs in airport equipment.

3. SUBMITTAL OF QUALIFICATION REQUESTS. Requests for qualification must be submitted in writing to a third party certifier listed in Appendix 1 of this AC. This request must include the following:

a. A list of the types, classes, styles, and sizes of equipment, along with the manufacturer's catalog numbers for which qualification certification is requested. A list of equipment options should also be included when so specified in individual equipment specifications.

b. Engineering assembly and schematic drawings of the equipment to permit determination of adherence to specification design requirements.

c. A copy of the proposed test procedures and test data sheets, and a statement as to whether the manufacturer proposes to conduct the tests at its own facility, or the name and location of a thir l party testing laboratory where the tests are to be conducted. Since the third party certifier reserves the right to witness any or all tests, the manufacturer should not commence the tests until consultation with the third party certification body. The third party certifier must conduct initial inspections and audits of any new laboratories used for testng. The third party certifier may elect to witness or waive the option to witness the tests. The manufacturer shall give the third party certifier at least 2 weeks notice prior to starting tests.

d. A statement that the manufacturer agrees, to provide the following minimum warrantee for the equipment:

"That the equipment has been manufactured and will perform in accordance with applicable specifications and that any defect in design, materials, (excluding lamps), or workmanship which may occur during proper and normal use during a period of 1 year from date of installation or a maximum of 2 years from date of shipment will be corrected by repair or replacement by the manufacturers f.o.b. factory."

e. A statement that the manufacturer agrees to provide and maintain a quality control program in accordance with FAA-STD-013 or suitable alternative such as ISO 9000 or Department of Defense quality standards. The manufacturer should provide a copy of the proposed quality control program.

f. A copy of the proposed instruction manual for the equipment and a copy of each products Listed Products Description Sheet.

4. REVIEW PROCEDURE FOR QUALIFICATION REQUESTS. After receipt by the third party certifier of the request for qualification, the manufacturer will be notified as to whether the proposed test procedures, test data sheets, and other documentation are acceptable. A mutually acceptable schedule for conducting tests should be agreed upon at that time. The manufacturer will be notified, in writing, after the last submittal of the required documentation or test results of the results of the equipment qualification testing. If the equipment qualifies, the manufacturer will be issued a Certificate of Conformance. The review procedure and associated time frames shall be outlined by the third party certifier in the procedural guide. The certification will be subject to the condition that it may be rescinded if:

a. The manufacturer fails to provide the required manuals.

b. The manufacturer fails to honor the warrantee (paragraph 3d) or does not maintain quality control in accordance with the approved plan (paragraph 3e).

c. The equipment has an unsatisfactory failure rate (paragraph 6).

d. The manufacturer fails to perform the required production tests (paragraph 5).

e. Changes are made in the equipment without approval from the third party certifier (paragraph 7).

f. The equipment specification is canceled or is revised and the manufacturer fails to requalify (paragraph 8).

g. The manufacturer is found not in conformance with the quality control requirements of paragraph 3e or other program requirements.

h. The equipment does not comply with the requirements for recertification (paragraph 5b).

5. TESTS.

a. Qualification Tests. The equipment must successfully pass all qualification tests described in the applicable specification. The manufacturer shall bear all associated costs. The tests may be witnessed by the third party certifier at the manufacturer's laboratory or at a third party laboratory. Laboratories must conform to ISO/IEC Guide 25. Where the third party certifier waives the option to witness tests, the manufacturer must submit a certified copy of all test reports.

b. Recertification. Each piece of equipment must be requalified every 8 years.

c. Equipment Requirements. The equipment must meet the requirements described in the applicable AC. The third party certifier may require additional testing of equipment and/or system components to demonstrate compliance to requirements, in areas where qualification testing does not address a specific requirement.

d. Production Tests. In addition to qualification tests and equipment requirements, each equipment specification requires some tests to be conducted on production units. The manufacturer must retain records of the production tests for 3 years, unless otherwise specified in the equipment specification, and permit the third party certifier to witness such tests or inspect previous records on request.

e. Lamp Life Tests. Lamp life tests shall be conducted in accordance with the procedures contained in Appendix 5, Lamp Life Test Procedure.

6. UNACCEPTABLE FAILURE RATE. Since reliable equipment is of prime importance to safety of airport operations, equipment which proves unreliable in use (as determined by the FAA) may be removed from the certified listing. The determination of unreliability will be based on judgment and experience with equip-ment of a like nature. Where any such equipment is deemed to have an unsatisfactory failure rate or is deficient in workmanship or materials, the manufacturer will be notified in writing by the FAA as to the basis for this determination. The manufacturer shall then notify the FAA in writing within 15 working days as to its plan of action for correcting the problem. If the manufacturer does not resolve the problem within a reasonable time (the time frame will, of necessity, be based on safety considerations and/or the nature of the problem), the manufacturer and third party certifier will be notified and the equipment will be removed from the certified listing. The FAA reserves the right to require the equipment to be subjected to any or all qualification tests when the equipment has been deemed unreliable.

7. MODIFICATIONS TO EQUIPMENT. Once an equipment type has been certified, the manufacturer may not make any changes in the equipment without submission of the changes to and recertification by the third party certification body. Requests for design or component changes must be submitted in writing to the third party certification body and must be accompanied by supporting documentation plus (if applicable) copies of the revised instruction manual pages which reflect the proposed change. The third party certifier will review the modification. If acceptable and required, it will issue a revised Certificate of Conformance. Substitution of stock electrical items such as resistors, capacitors, transistors, etc., which are identical in form, fit, and function and which are equal or better in quality and rating is permissible. Although such substitution does not necessarily require recertification, the manufacturer shall supply the third party certifier a list of the substituted items for filing with the inspection records. This exception does not apply to lamps.

8. REVISION OF SPECIFICATIONS. The FAA may, at times, revise the specification for a particular equipment to reflect changing needs of aviation or of new technology. In such a case the revised equipment specification will contain an effective date, normally 6 months, at which time the prior certification automatically expires unless the manufacturer has been requalified to the revised specification. Manufacturers will be informed by letter and supplied a copy of the revised specification within a few days of its issuance. The procedure for requalification is the same as for the original qualification as discussed in paragraph 3 with the following exceptions (not applicable to any equip-ment not tested under this program or a prior grand-fathered manufacturer):

a. The manufacturer does not have to resubmit the quality control plan unless changed.

b. Depending on the nature of the equipment modification, it may not be necessary to perform all qualification tests. Exemption from certain tests may be granted by the third party certifier when requested and justified by the manufacturer that the test is not applicable to the modified design.

9. EXEMPTION FROM SPECIFICATION REQUIREMENTS. No exemptions from the specifications, except as specified in paragraph 8, will be granted. However, it is recognized that equipment specifications may not cover all specific design and operational applications and that equipment may be submitted for certification that does not meet all specification requirements. If the proposed design is considered by the FAA to have merit, then the applicable equipment specification will be revised by the FAA to reflect the proposed design and submitted for comment through the normal coordination process with the aviation community. If no valid adverse comments are received by the FAA on the proposed revision, the proposed design may be given an interim certification before final certification and publication of the revised specification. In such cases, other manufacturers of similar equipment will be notified of the certification and of the forthcoming specification revision.

10. PUBLICATION OF CERTIFIED EQUIPMENT. A listing of equipment that has been certified by third party certification bodies will be published under the Internet home page for Airports on a monthly basis as addendum file to this AC. The list can also be obtained from the Office of Airport Safety and Standards, Attention: AAS-200, Federal Aviation Administration, 800 Independence Ave., SW, Washington, DC 20591, or from those FAA offices as listed in AC 150/5000-3, current edition.

11. Internet Access. This AC and latest certified equipment list is available on the Internet on the FAA Office of the Associate Administrator for Airports (ARP) home page (www.faa.gov/arp/arphome.htm).

APPENDIX 3. CERTIFIED AIRPORT LIGHTING EQUIPMENT.

NOTICE TO USERS

This appendix provides a list of the current equipment under the certification program. The specification for each type of equipment listed below in this document is contained in the AC given. The equipment specification defines the type, class, and style classifications used in the listing. Not all combinations of type, class, and style are permissible. The equipment specification should be consulted for approved equipment configurations.

An addendum to this appendix listing all current certified equipment with the manufacturer is updated monthly. It is available on the Internet at FAA Office of the Associate Administrator for Airports (ARP) home page (www.faa.gov/arp/arphome.htm) under "Advisory Circulars" in the file titled "150/5345-53 Addendum". This addendum can also be obtained from the Office of Airport Safety and Standards, Attention: AAS-200, Federal Aviation administration, 800 Independence Ave., SW, Washington, DC 20591, or from those FAA offices as listed in AC 150/5000-3, current edition.

For the sake of brevity in the addendum, manufacturers who have qualified an entire equipment series or product line have the equipment listed under a single general catalog number. These general numbers are not intended for use in ordering equipment, and users should consult equipment manufacturers' catalogs or literature for complete ordering information, especially for equipment having optional features. For each fixture, the number in parentheses ( ) after the manufacturer's catalog number indicates the specific lamp type used in testing the equipment. A description of each lamp use is provided in the addendum.

L-801 Beacons, Medium Intensity (AC 150/5345-12)

L-802 Beacons, High Intensity (AC 150/5345-12)

L-804 Light, Holding Position Edge (AC 150/5345-46)

L-806 Wind Cones, Frangible (AC 150/5345-27)

L-807 Wind Cones, Rigid (AC 150/5345-27)

L-810 Lights, Obstruction (AC 150/5345-43)

L-821 Panel, Airport Lighting Control (AC 150/5345-3)

L-823 Connectors, Cable (AC 150/5345-26)

L-827 Monitors, Regulator (AC 150/5345-10)

L-828 Regulators, Constant Current (AC 150/5345-10)

L-829 Regulators, Monitored Constant Current (AC 150/5345-10)

L-830 Isolation Transformers, 60Hz (AC 150/5345-47)

L-831 Isolation Transformers, 50Hz (AC 150/5345-47)

L-841 Cabinet, Auxiliary Relay (AC 150/5345-13)

L-847 Switch, Circuit Selector (AC 150/5345-5)

L-849 Lights, Runway End Identification (AC 150/5345-51)

L-850 Lights, Runway, Inpavement (AC 150/5345-46)

L-852 Lights, Taxiway, Inpavement (AC 150/5345-46)

L-853 Markers, Retroreflective (AC 150/5345-39)

L-854 Radio Controls (AC 150/5345-49)

L-856 Lights, Obstruction, High Intensity, White, 40 FPM (AC 150/5345-43)

L-857 Lights, Obstruction, High Intensity, White, 60 FPM (AC 150/5345-43)

L-858 Signs, Runway and Taxiway (AC 150/5345-44)

L-859 Lights, Flashing, Omnidirectional (AC 150/5345-51)

L-860 Lights, Runway Edge, Low Intensity (AC 150/5345-46)

L-861 Lights, Runway & Taxiway Edge, Medium Intensity (AC 150/5345-46)

L-862 Lights, Runway Edge, High Intensity (AC 150/5345-46)

L-863 Lights, Portable Runway (AC 150/5345-50)

L-864 Lights, Obstruction, Red, 20-40 FPM (AC 150/5345-43)

L-865 Lights, Obstruction, Medium Intensity, White, 40 FPM (AC 150/5345-43)

L-866 Lights, Obstruction, Medium Intensity, White, 60 FPM (AC 150/5345-43)

L-867 Light Base, Non-Load Bearing (AC 150/5345-42)

L-868 Light Base, Load Bearing (AC 150/5345-42)

L-869 Junction Box (AC 150/5345-42)

L-880 Precision Approach Path Indicator (AC 150-5345-28)

L-881 Abbreviated Precision Approach Path Indicator (AC 150/5345-28)

L-882 Generic Visual Approach Descent Indicator (AC 150/5345-52)

L-883 Generic Visual Approach Descent Indicator (AC 150/5345-52)

Light Structure, Lightweight (AC 150/5345-45)

L-885 Lights, Obstruction (AC 150/5345-43)

APPENDIX 4. ADDRESS LIST OF CERTIFIED AIRPORT LIGHTING EQUIPMENT MANUFACTURERS.

This appendix is a list of the manufacturers with one or more pieces of certified equipment at the time of release of this AC. An addendum to this appendix, listing all current certified equipment manufacturer's addresses, is updated monthly. Listing of a manufacturer in this appendix does not indicate that all of that manufacturer's products are certified; the addendum must be reviewed to assure certification of individual products. The addendum is available on the Internet at FAA Office of the Associate Administrator for Airports (ARP) home page (www.faa.gov/arp/arphome.htm) under "advisory circulars" in the file titled "150/5345-53B Addendum". The addendum can also be obtained from the Office of Airport Safety and Standards, Attention: AAS-200, Federal Aviation administration, 800 Independence Ave., SW, Washington, DC 20591, or from those FAA offices as listed in AC 150/5000-3, current edition.

ADB
977 Gahanna Parkway
P.O. Box 30829
Columbus, Ohio 43230
(614) 861-1304

Airfield Reflections, L.C.
11854 El Camino Del Diablo
Yuma, AZ 85367
Phone (520) 342-0369
Fax (520) 342-2363

Airport Lighting Company (of CT)
108 Fairgrounds Drive
Manlius, NY 13104
Phone (315) 682-6461
Fax (315) 682-6469

Airport Lighting Equipment Inc..
1140 East Main Street
Burley, ID 83318
Phone (208) 678-2169
Fax (208) 678-2311

Airport Systems International, Inc.
11300 W. 89th Street
Overland Park, KS 66214
Phone (913) 492-0861

Amerace Ltd.
77 W. Beaver Creek Rd.
Richmond Hill, Ontario
Canada L4B 3A7
(905) 882-8008

Appollo Lighting Company
2162 Union Place
Simi Valley, California 93065
(805) 581-5591

Architectural Graphics, Inc.
2655 International Parkway
Virginia Beach, Virginia 23452
(804) 427-1900

Carsonite International Corp.
10808 Gifford Blvd P.O. Box 88
Early Branch, South Carolina 29916-0098
(800) 648-7074

Cegelec Projects, Ltd.
Boughton Road
Rugby CV21 1BU
England
44(788) 563384

Control Industries, Inc.
409 Lafayette Avenue
Urbana, Ohio 43078
(513) 653-7694

Crouse-Hinds Airport Lighting Products
1200 Kennedy Road
Windsor, Connecticut 06095
(860) 683-4300

Crouse-Hinds Joy Molded Products
Route 4, Box 156
La Grange, North Carolina 28551
(919) 566-3014

DeVore Aviation Corporation
6104 Kircher Boulevard, N.E.
Albuquerque, New Mexico 87109
(505) 345-8713

ERNI Airlight, Inc.
12701 North Kingston Avenue
Chester, VA 23831
Phone (804) 530-0484
Fax (804) 530-4281

Fields Aviation Products
8626 G Street
Oakland, CA 94603
(510) 569-7929

Flash Technology Corporation
P.O. Box 329
55 Lakc Strcet
Nashua, New Hampshire 03060
(603) 883-6500

FlexStake, Inc.
3070 Palm Avenue
Ft. Myers, FL 33901
(813) 334-3550

Flight Light Inc
3513 La Grande Blvd.
Sacramento, CA 94080
(916) 394-2800

Hali-Brite Inc.
P.O. Box 10
Crosby, Minnesota 56440
(800) 553-6269

Hubbell Lighting, Inc.
2000 Electric Way
Christiansburg, VA 24073
(703) 382-6111

Hughey & Phillips, Inc.
2162 Union Place
Simi Valley, California 93065
(805) 581-5591

Jaquith Industries, Inc.
East Brighton and Glen Avenues
P.O. Box 780
Syracuse, New York 13205
(315) 478-5700

Litebeams, Inc.
223 West Palm Avenue
Burbank, California 91502
(818) 843-2711

Manairco, Inc.
28 Mansfield Industrial Park
Mansfield, Ohio 44903
(419) 524-2121

Molded Electric Products Corp.
290 Pratt Street
Meriden, Connecticut 06450
(203) 235-4424

Multi-Electric Manufacturing, Inc.
4223-43 West Lake Street
Chicago, Illinois 60624
(312) 722-1900

Olson Industries, Inc.
P.O. Box 758
Star Route 4
Atkinson, Nebraska 68713
(402) 925-5090

Point Lighting Corporation
540 Hopmeadow Street
P.O. Box 686
Simsbury, Connecticut 06070
(860) 658-0433 Fax (860) 658-1872
(800) 900-0433

Safegate Airport Systems, Inc.
3700 NW 124 Avenue, Suite 135
Coral Springs, FL 33065
Phone (954) 755-9330
Fax (954) 346-8000

SAFE-HIT, a subsidary of
Energy Absorption Systems, Inc.
1930 W. Winton Avenue, Bldg 11
Hayward, CA 94545
(510) 783-6550

SAFE Installation Company
2200 Spring Garden Avenue
Pittsburgh, PA 15212
(800) 837-4774
412-231-7399

Sola/Hevi-Duty Electric Co.
Box 268
Goldsboro, North Carolina 27533-0046
(800) 377-4384

Standard Signs, Inc.
3190 East 65th Street
Cleveland, Ohio 44127
(216) 341-5611

TWR Lighting, Inc.
1630 Elmview
Houston, Texas 77080
(713) 973-6904

Universe, Inc.
1833 West Hovey Avenue
Normal, Illinois 61761-4315
(309) 454-5665

APPENDIX 5. LAMP LIFE TEST PROCEDURE.

1. **PURPOSE.** This appendix specifies a test method for establishing lamp life for airport lighting fixtures. This procedure shall be accomplished on each new fixture, design or on any design change which will affect lamp life.

2. SCOPE. This procedure shall be performed on all lamps having a specified lamp useful life of 17,500 hours or less.

3. DEFINITIONS. The following terms are defined for the purpose of this procedure:

a. RATED LAMP LIFE. The mean life of the lamp while installed and operated in a lighting fixture as established by test and calculation described in this procedure.

b. LAMP USEFUL LIFE. The portion of the lamp operating characteristic where the photometric output of the lamp operating in the fixture is within specification requirements.

c. LAMP OPERATING TIME. The time that electrical service to the lighting system is on and contacts to lamp circuits are closed.

d. ACCELERATED TESTING. The testing technique used to compress the time to operate a lamp to end of useful life while under test. A correlation between performance of the lamp under normal operating conditions and the conditions for accelerated testing must be established. Note: Accelerated testing cannot be performed on tungsten halogen lamps.

4. CONDITIONAL CERTIFICATION OF EQUIPMENT. Equipment submitted for qualification testing prior to completion of lamp life tests may be given a conditional certification if the following conditions have been met:

a. The lighting fixture manufacturer has submitted its written procedure for conducting the lamp life tests in accordance with paragraph 5 below.

b. A schedule for conducting the tests has been established.

c. The procedure has been reviewed and approved by a third party certification body.

If a conditional certification has been given for a piece of equipment and it subsequently does not pass the lamp life tests, the certification will be rescinded.

5. TEST SPECIFICATION. The test procedure is divided into two parts: normal and accelerated testing. Although normal testing is preferred, accelerated testing is acceptable under special circumstances. When accelerated testing is performed, the test shall be backed up with a normal test as soon as practical. Accelerated test reports shall include a schedule indicating when normal testing will be completed. Normal testing may be waived by the third party certifier if a correlation, verified by test, exists.

The lighting fixture manufacturer shall use the most conservative lamp designer's life rating, derated by 15 percent, in determining lamp life. No credit shall be given for any techniques or devices used to extend lamp life. Lamp life shall be quoted as "Lamp life estimated" during this period.

a. Normal Testing.

(1) The test shall consist of a minimum of 10 randomly selected lamps installed in the fixture for which life data is being established. If additional lamps are to be tested, the tests shall be performed in multiples of 10 lamps.

(2) Lamps shall be installed in the fixture and tested in the configuration which simulates the actual "as installed" condition of the light system (e.g., in-pavement lights should be tested with the lamp fixture installed on the smallest base can which in turn is buried in a non-heat absorbing medium, such as sand).

(3) Where lighting system power conditioning equipment is located remote from lamp units in the field, cabling between lamp and system components shall be shortest allowed by design.

(4) Light system shall be operated at highest lamp manufacturer rated voltage or current using approved regulators or current supply having one percent regulation. The duty cycle shall consist of 20 hours lamp operating time and 4 hours deenergized. Voltage controlled system shall be operated from a supply having three percent regulation.

(5) Testing shall continue until 90 percent of all lamps have reached end of lamp useful life.

(6) Tests shall be performed in a controlled environment at an ambient temperature between 60 and 80 degrees Fahrenheit.

(7) Electrical service voltage and current; lamp voltage and current; and for discharge type lights, pulse train wave shape and frequency shall be randomly recorded using calibrated instruments during the test period to verify that control circuits are functioning and that input energy is maintained within tolerance. As a minimum, these parameters shall be checked twice a week.

(8) A daily log shall be maintained at the test site. The log shall record lamp condition (e.g., whether the photometric output of the lamp exceeds minimum specification requirements), date, time, comments, and person performing the check.

(9) The pulse train wave shapes shall be monitored continuously during the duty cycle for discharge type lamps. Out-of-tolerance condition shall be logged. As a minimum, the following shall be monitored for out of tolerance conditions:

(a) Pulse train wave shape.

(b) Pulse train frequency.

(c) Voltage or current to lamp circuits.

b. Accelerated Testing.

(1) Accelerated testing may be performed when normal testing is estimated to exceed 180 calendar days or to provide a basis for estimating lamp life on short notice, such as when evaluating new designs. Under no circumstances should accelerated testing reduce the normal test time by more than 1/3 of the normal test time based on lamp manufacturer life estimates. All accelerated tests shall be followed by normal testing in accordance with paragraph 5a to establish a correlation between accelerated and normal test rated lamp life test results.

(2) Accelerated tests shall follow the procedure described in paragraph 5a with the exception that the appropriate parameters are increased so that the estimated test time is reduced as specified above.

(3) In addition to the documentation requirements defined below, the testing authority should provide the rationale for selecting the parameters for the accelerated tests. Lamp vendor data shall form the basis for the rationale.

6. ANALYSIS OF DATA.

a. Form a list of the 90 percent of the lamps which have reached the end of lamp useful life. The list should include lamp number and lamp operating time as calculated below. This information should be arranged in ascending order of lamp operating time.

b. Lamp operating time is calculated by multiplying the number of full days that the lamp was operating by 20 (hours).

c. Delete the lamps with the 10 percent lowest lamp operating times from the calculations below.

d. Calculate the mean and standard deviation for the 80 percent of the lamps remaining on the list.

e. If the standard deviation is greater than 50 percent of the mean, delete the lamps with the 10 percent highest and 10 percent lowest lamp operating times from the table. Recalculate the mean and standard deviation for the remaining 60 percent of the lamps on the list.

f. Lamp life is the mean calculated above, rounded to the nearest 50 hours.

7. DOCUMENTATION. A test report documenting the test results and containing a copy of the calculations shall be prepared. As a minimum, the report shall include the information listed below.

a. A drawing or sketch of the test setup indicating installation of the test fixture(s), instrumentation, and a block diagram indicating all electrical interconnections. This drawing shall be of sufficient detail so that an independent laboratory may perform the test and replicate the test results.

b. A calculation sheet indicating number of days each lamp operated, lamp operating hours, and data used in calculating the mean and standard deviation.

c. Copy of all wave shapes recorded in paragraph 5.a.(9) with calibration markings.

d. A description of all malfunctions which occurred during the test period including type of malfunction, date of occurrence, corrective action taken, and quality assurance concurrence on resolution.

e. A summary of the pulse train out-of-tolerance conditions shall be included. The summary shall list specific type of out-of-tolerance condition, number of times occurred, and frequency of occurrence.

APPENDIX 6. PROCEDURAL GUIDE OUTLINE.

1. SCOPE.

a. Basis of Program
b. Certifier's Role
c. Manufacturer's Role
d. FAA Role

2. LICENSE AGREEMENTS.

3. EQUIPMENT QUALIFICATION PROCEDURES.

Use procedures in Appendix 2 as a guide.

4. SEMIANNUAL INSPECTIONS.

a. Timing of Inspections
b. Production Records
c. Inspection Review Report
d. Corrective Action
e. FAA Notification

5. QUALITY CONTROL.

a. Audit Visits
b. Rating System

6. PRODUCTION TESTING.

7. APPEALS PROCEDURE.

8. CHALLENGE PROCEDURE.

a. Written Challenge
b. Documentation
c. Costs
d. Sample Product
e. Testing
f. Corrective Action
g. Payment

9. USE AND FUNCTION OF FORMS.

10. FORMS

APPENDIX 7. SAMPLE CERTIFICATION.

PROGRAM ADMINISTRATOR
(Name and address of Third party certifier)

DATE: _____
(This date is the date of last issued certification based on complete test data)

_____
_____
_____

AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM

CERTIFICATION OF CONFORMANCE

Name and Address of Manufacturer
_____
_____
_____

The equipment listed below is hereby certified in accordance with the procedures contained in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5345-53, Airport Lighting Equipment Certification Program (ALECP). The certification is based on successful completion of tests and conformance with requirements of the specifications listed in AC 150/5345-xx and the reporting to the Program Administrator the results of such tests, accompanied by related documents.

ITEM NUMBER - ITEM NAME (AC 150/5345-xx)								
Type	Rating	Class	Style	Size	Watts	Amps	Lamps No.	Mfgr's. Cat. No.
(NOTE: Use headings appropriate for the equipment tested)							Number from AC 150/5345-53 Appendix 3. If not listed, give description (designation, Watts, volts, amps) and manufacturer	
Indicate lamp designation (number, watts, volts, amps, as appropriate) and manufacturer								

1. This equipment requires continuing validation in accordance with the requirements of AC 150/5345-53.

2. Product tested and report issued by:
   (A) Report No.:_____
   (B) Date of Report:_____
   (C) FAA Specification No.:_____

APPROVED FOR CERTIFICATION:

BY: Certifier's Signature_____
Certifier's Typed Name_____
DATE: Date Signed_____

U.S. Department
of Transportation

**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

**FORWARDING AND ADDRESS
CORRECTION REQUESTED**

Official Business
Penalty for Private Use $300